



Monitoring vs. Modeling

An Interactive Exercise



Air Toxics Exposure Assessment Workshop

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June 25, 2002**

Typical Usage for Air Toxics

- **Air Quality Modeling**

- Predicts both acute and chronic ambient levels
- Fenceline to national scale
- Show compliance with air toxic guidelines
- Can model historical as well as “what-ifs”
- Used to site monitor locations

- **Ambient Monitoring**

- Measure both acute and chronic ambient levels
- Enforcement issues
- Develop and/or Validate Air Quality Models

Purposes Of Modeling/Monitoring

- Public Awareness
- Risk Assessment
- Develop Control Strategies
- Evaluate effectiveness of mitigation measures
- Set Standards
- Evaluate compliance with Standards

Strengths/Weaknesses

- **Air Quality Modeling**

- Predictions include a measure of uncertainty
- Relatively fast
- Relatively inexpensive
- Representative data issues
- Results over a large spatial domain

- **Ambient Monitoring**

- Less uncertainty in measurements (in most cases)
- Time consuming (real time plus)
- Threshold/Method limits
- Logistics issues
- Relatively expensive
- Results over a limited spatial domain

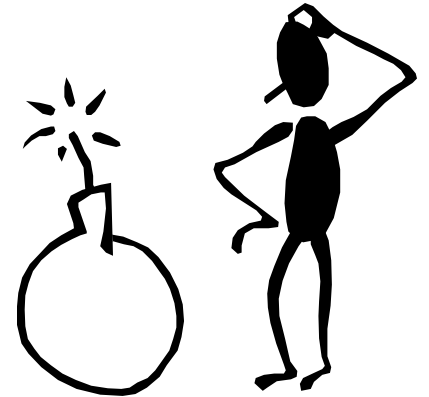
Which one do you use?????

- Some things to consider:
 - Accuracy of results required
 - Budget constraints
 - Time constraints
 - Labor constraints
 - Availability of data to populate model
 - Availability of appropriate model
 - Relationship between to source/receptor

Case Study Scenario - Summary

- **Problem:**

Increase of severe nasal and lung irritation and headaches for the past six months, including hospital admissions

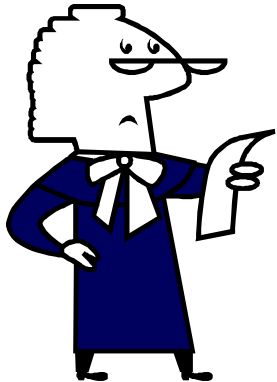


You are Joe/Jane Regulator; What do you do?

Boss gives you a 100K budget and tells you to “fix” the problem

Boss is good friends with S&P consulting!!!

Public meeting planned in 90 days



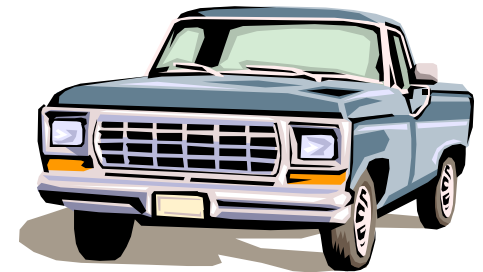
Case Study Scenario - Summary

- **Suspect Sources??**

- **Community Plating Company**

- Chrome Electroplater Facility
 - Several densely populated communities nearby
 - School, hospital all within 1 km
 - All permits appear to be in compliance

- **New 4 lane Highway NW of town**



Pleasure valley Study Area

Interstate R9

North Square

4000 People

1000 Meters
from Plater

Hospital

Eastern
Quadrant

2000 People

Western Valley

Community
Plating

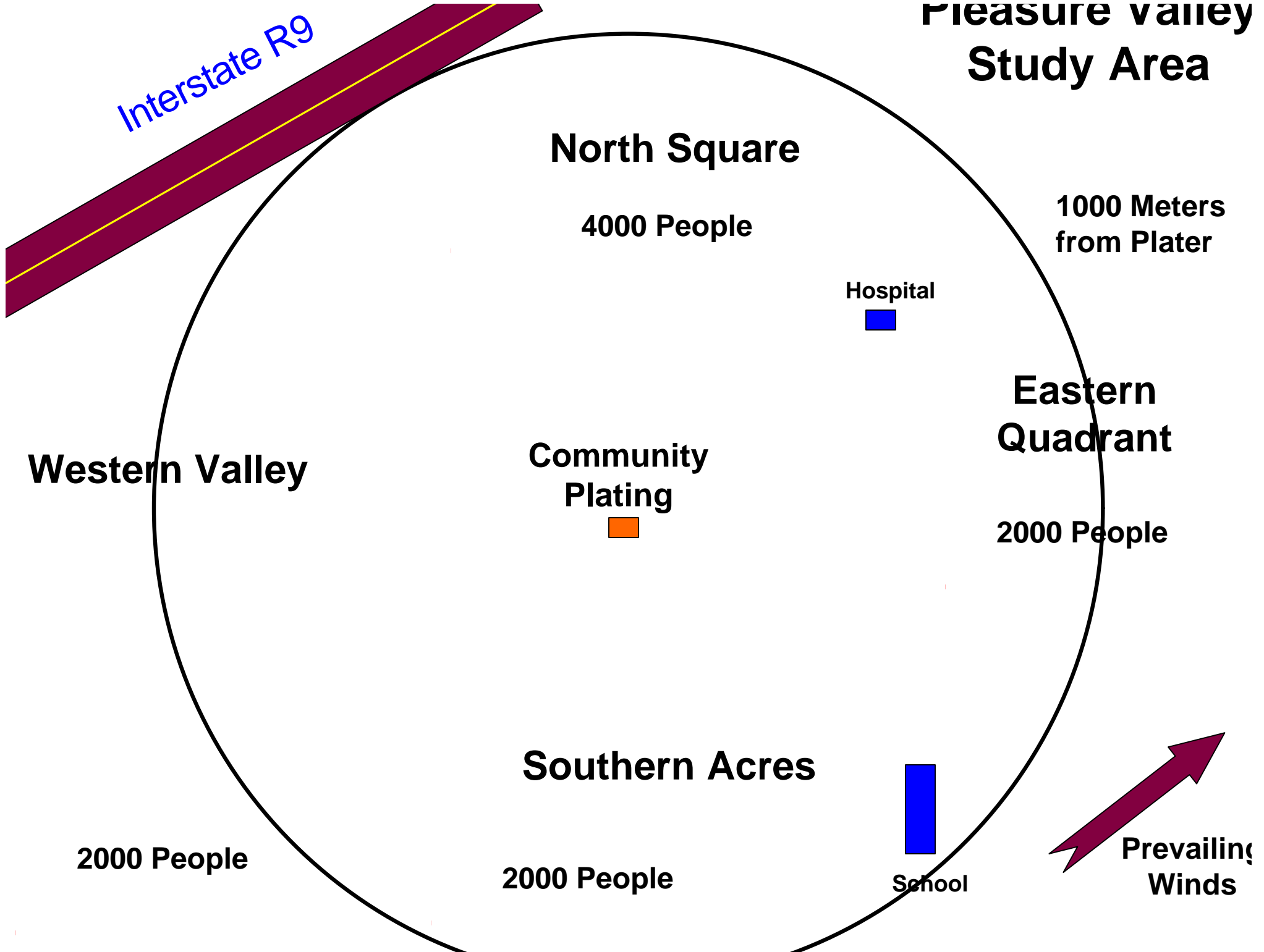
Southern Acres

2000 People

2000 People

School

Prevailing
Winds



S&P Consulting



- We can provide all your environmental consulting needs
 - Modeling
 - Monitoring
- Our Motto: You get what you pay for!!! Cheap, Fast, Accurate (pick 2)
- Call/ask for proposal/price list

Planning Team



- Monitoring Expert
- Modeling Expert
- Meteorologist
- Community Relations Expert
- Data Analyst

Community Reaction Panel



- Mother of child with asthma
- Pleasure Valley City Council Member
- Hospital Director
- Community Plating Company owner
- Representative of EDPV (Environmental Defenders of Pleasure Valley)

Community Scorecard

	1 (low)	2	3	4	5 (High)
1. Confidence Identified Problem					
2. Allayed My Fears					
3. Know Who Is At Risk					
4. Know What to Do to Protect Them					
5. Know How to Control Problem					
6. Was modeling data adequate to satisfy your needs					
7. Was Monitoring data adequate to satisfy your needs					
8. Was balance of Monitoring and Modeling appropriate					
9. Know Next Steps					
10. S&P Earned Their Fee					

Modeling/Monitoring Task List

Task	Item Cost (k)	Total Cost
Emissions Characterization (plant only)	25	
Monitoring Tasks:		
Total Speciation	5 (per Monitor)	
Speciated VOC Monitor	10	
Total PM Monitor	5	
PM2.5 Monitor	10	
Speciated Metals Monitor	15	
Collect Meteorological Data.	5	
Screening Modeling Analysis	15	
Refined Modeling Analysis.	30	
Survey Community Concerns	5	
Prepare for Community Meeting	5	
Community Meeting	5	
Total		

Lesson Learned



- Every situation is unique
- Must balance competing needs and interests
- May have to live with limited resources and technical capabilities
- Communication is as important as the science
- Keep these issues in mind as you go through the next 2 days!!!